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What Do Women Want? Facialmetric Assessment of Multiple Motives in the Perception of Male Facial Physical Attractiveness

Michael R. Cunningham and Anita P. Barbee
University of Louisville

Carolyn L. Pike
North Carolina State University

The multiple motive hypothesis of physical attractiveness suggests that women are attracted to men whose appearances elicit their nurturant feelings, who appear to possess sexual maturity and dominance characteristics, who seem sociable, approachable, and of high social status. Those multiple motives may cause people to be attracted to individuals who display an optimal combination of neotenous, mature, and expressive facial features, plus desirable grooming attributes. Three quasi-experiments demonstrated that men who possessed the neotenous features of large eyes, the mature features of prominent cheekbones and a large chin, the expressive feature of a big smile, and high-status clothing were seen as more attractive than other men. Further supporting the multiple motive hypothesis, the 2nd and 3rd studies indicated that impressions of attractiveness had strong relations with selections of men to date and to marry but had a curvilinear relation with perceptions of a baby face vs. a mature face.

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Male physical attractiveness involves a paradox. Evolutionary analyses emphasized the importance of power and status in male attractiveness, with reports that females of a wide variety of species preferred powerful, mature, high-status males over less powerful, immature, and low-status males (Cunningham, 1981; Darwin, 1971; Symons, 1979; Trivers, 1985; Wilson, 1975). Consistent with this perspective, Sadalla, Kenrick, and Vershure (1987) found that women preferred men who displayed dominant attitudes over men who displayed submissive attitudes.

It might follow that perception of male physical attractiveness might be based on physical features that suggest dominance, power, maturity, or status. Reis et al. (1982) found that men who were rated as physically attractive also tended to be more socially assertive than other men. Research on the perception of dominance in faces provides further support for this view. Keating (1985) used an IdentiKit to create line drawings of faces to test the effect of feature variations on perceptions of both dominance and attractiveness. She found that male faces with the individual mature features of small eyes and thin lips were associated with higher ratings of dominance. Faces with the individual mature features of a square jaw and thin lips were rated as more attractive than male faces with round jaws or thick lips. Finally, women rated male drawings with the combination of four mature features of thick eyebrows, small eyes, thin lips, and square jaws, as more dominant and more attractive than faces with thin eyebrows, large eyes, thick lips, and round jaws. The attractiveness means for the mature and immature combination faces were 4.4 versus 3.9 on a 7-point scale. Such results suggested that maturity features influence the perception of male attractiveness, although the most mature faces were not seen as extremely handsome.

Research on the perception of attractiveness in the male body adds further complexity to this analysis (Franzoi & Herzog, 1987). Beck, Ward-Hull, and McClear (1976), for example, reported that women preferred male silhouettes with chests that were slightly larger than average, but the women did not prefer men with the largest and most powerful-appearing silhouettes. Horvath (1981) also reported that women preferred male figure drawings with only moderately broad shoulders, and Lavrakas (1975) concluded that "the traditional image of the muscleman holds little attraction for most women" (p. 332). Similarly, Graziano, Brothen, and Berscheid (1978) found that women, even tall women, preferred men who were medium in height over those who were either tall or short. If power, maturity, and dominance are desirable attributes, why are the biggest and tallest men not preferred over medium-sized men by women?

Symons (1987) proposed a curvilinear relation between physical feature size and perceived attractiveness, suggesting that "for some physical characteristics, the population mean, or other measure of central tendency, may be the most attractive" (p. 107). Thus, bodies that are neither too large nor too small may be most adaptive for a wide range of environments, and that may account for female interest in moderate-sized men.

Yet women's attention to men may entail multiple motives,

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Correspondence concerning this article should be addressed to Michael R. Cunningham, Department of Psychology, University of Louisville, Louisville, Kentucky 40292.

and even conflicting interests, which may produce attraction to men with some physical features that deviate from the population mean. On the one hand, a woman may desire a man who appears dominant and mature, so that he might successfully compete against other men and provide ecological and genetic resources to help ensure her survival and that of their children. On the other hand, a woman might not only desire her mate to protect her but she may also wish to cooperate with and even protect and nurture her mate. Female chimpanzees have been found to show a distinct preference for male chimpanzees who groom them, spend time with them, and share food with them (Goodall, 1986). Tutin and McGinnis (1981) reported that at least half of the chimpanzee pregnancies that they observed were attributable to nondominant male chimpanzees who had formed consort relationships with the females, rather than to the dominant male of the troop. Similarly, women report that they desire men who are tender, gentle, sensitive (Nevid, 1984), kind, and understanding (Buss & Barnes, 1986). A man who looks too mature and too powerful, then, may not arouse the woman's warm, caregiving feelings and may not elicit as much attraction as a man who can stimulate nurturant responses (cf. Cunningham, 1989).

Some facial features that elicit feelings of nurturance and caregiving may increase female perceptions of male facial attractiveness. McArthur and Apatow (1983/1984) used an IdentiKit to construct faces that varied in their eye size, vertical placement of features, and length of features. Male targets with the babyish features of big eyes were rated as more handsome than were men with small eyes, 3.9 versus 2.6 on a 7-point scale. Extending their research on the perception of baby-faced adults, Berry and McArthur (1985) obtained ratings on a number of dimensions of 20 men presented in photographic slides. The sizes of the men's facial features also were measured with a ruler. Men with higher set eyebrows, larger iris areas, rounder irises, and narrower chins received higher ratings of facial babyishness than did their counterparts. The relations between feature sizes and attractiveness ratings were not reported, but a significant correlation, $r(18) = .38$, was obtained between perceived babyishness and attractiveness.

It may appear inconsistent that Keating found perceived male attractiveness to be associated with features suggesting maturity and dominance but that McArthur and Apatow, and Berry and McArthur found some indications that male attractiveness was associated with babyishness or immaturity. Yet such findings may not be mutually exclusive; the moderate attractiveness means of both the most mature faces in Keating's study and the most babyish faces in McArthur and Apatow's study suggest that extremely attractive male faces might possess both mature and childlike features.

Cunningham (1986) demonstrated that both childlike and mature features were present in highly attractive female faces. In two quasi-experimental studies, the highest female attractiveness ratings were found to be associated with the neonate features of large eyes and small nose area, which may stimulate nurturant affection, and with the maturity features of high cheekbones and narrow cheeks, which may signal sexual maturity and status. The most attractive faces also were found to possess the emotionally expressive features of a large smile, highly set eyebrows, and dilated pupils, which may convey friendliness and approachability.

Such multiple motives as the desire to provide nurturance; the desire to have a mate who is sexually mature, fit, and high in status; and the desire to develop a relationship with a person who is approachable and kind may be just as evident in women's responses to men as in men's responses to women. As a consequence, many of the same categories of features that influence men's attraction to female faces also may influence women's attraction to male faces.

A combination of neonate and mature features may indicate that an individual is at an optimal age for mating, but attractiveness may require more than the appearance of young adulthood (cf. Buss, 1987; Symons, 1979). Young adulthood can be conveyed through such cues as small eyes combined with a large nose, but such an appearance was found to be unattractive in women (Cunningham, 1986). The present analysis suggests that one set of age-linked facial features convey positive infantile qualities, and age-related changes in those features may imply the absence of those attributes. Another set of age-linked facial features may indicate pubescent maturation, and the degree of development of those features may imply the presence of additional qualities. The following typology of facial features embodies these assumptions and is offered for its heuristic value in predicting male attractiveness:

1. Neonate features: A number of facial features, including relatively large eye height and width, and small nose size, are particularly characteristic of infants (Enlow, 1982). Faces with such neonate features have been found to elicit more positive evaluations and more protective, caretaking responses from adults (Alley, 1983; Hildebrandt & Fitzgerald, 1978; Sternglanz, Gray, & Murakami, 1977). A face with markedly neonate features possibly suggests childlike innocence, spontaneity, intimacy, and vulnerability; therefore, a man who retains relatively large eyes and a small nose into adulthood may continue to elicit the fondness and nurturance usually shown to infants. By contrast, a face with less childlike features, with smaller eye size and larger nose size, may convey a lower need for affection and care (McCabe, 1984) and may suggest other undesirable qualities of older age, such as lower vivaciousness.

Larger foreheads and lower placed eyes also may convey neoteny, especially in profile, but these features were not related to attractiveness ratings in previous investigations of frontal views of faces (Berry & McArthur, 1985, Cunningham, 1986). The list of neonate cues currently hypothesized to be attractive rests on ethological observations (Eibl-Eibesfeldt, 1970), but other attributes, such as sparse scalp hair and puffy eyelids, are evident in human newborns but do not seem to contribute to the attractiveness of infants or adults. The social and evolutionary dynamics that have caused some neonate features to be endearing and have caused others not to be must await further analysis.

2. Mature features: Mature features include several attributes of the face that reflect the masculinization or feminization that may occur during puberty. Larger chin bones, more prominent cheekbones, thinner cheeks, and thicker facial hair all occur in men following virilization and may be responsive to the individual's endocrine levels (Bellak & Baker, 1981; Farkas,

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1987).[1] As a consequence, strong examples of masculine mature features may signify power, dominance, social competence, status, and sexuality (Guthrie, 1976; Keating, Mazur, & Segall, 1981).

Facial hair is a maturity feature, and bearded men have consistently been seen as more dominant and more masculine than nonbearded men (Kenny & Fletcher, 1973; Pellegrini, 1973; Woods, 1986). The evaluation of men displaying an aggressive symbol of masculinity, however, may be influenced by sociocultural conditions (Liggett, 1974; Robinson, 1976) and individual tastes. Some studies have found faces with beards to be desirable (Pancer & Meindl, 1978), whereas others found bearded faces to be unattractive (Feinman & Gill, 1977). The presence of a beard may cause a face that already appears mature to look too dominant and, thus, threatening.

The issue of feature categorization is complex. Mature features grow in proportion to the rest of the face through childhood and initially might seem to have the same impact on perception as the neonate features. Furthermore, some of the features that have been classed as mature entail a neotenous stage. Babies possess round cheeks and very small chins, due in part to buccal pads and toothlessness. Yet, unlike such neonate features as the eyes and nose, the infantile form of the cheeks and chin tend to disappear within the first few years of life, provided there is optimal nutrition (Enlow, 1982; Farkas, 1987). Those features also differ from the neonate features in being affected by sexual maturation, and consequently, their appearance may influence the perceiver on attributional dimensions related to maturation. Consistent with this view, Cunningham (1986) found that narrow female cheek width was associated with perceived fertility. Thus, the appearance of neonate and mature features may convey the correlated but separate dynamics of age and of sexual maturation, respectively. An individual may be recognized as a young adult through developmental changes in his eyes and nose, but he may require a large chin, prominent cheekbones, and evidence of a beard to be seen as a strong and virile young adult.

3. Expressive features: Features such as the mouth and the eyebrows may gain attractiveness by signaling positive emotions. Although a smile may convey submissiveness, it generally signals joy, confidence, and sociability (Kraut & Johnston, 1979). Mueser, Grau, Sussman, and Rosen (1984) reported that individuals who were smiling in photos received more positive attractiveness ratings than did nonsmiling targets. The effect of a smile on ratings may be stronger for perception of women than of men (Deutsch, LeBaron, & Fryer, 1987), but men whose features are particularly effective at signaling positive emotions, who have larger smiles, may be seen as particularly attractive.

Women with dilated pupils and with eyebrows arched relatively high above their eyes were seen as attractive (Cunningham, 1986), perhaps because such attributes conveyed interest and responsiveness (Nakdimen, 1984). Such a demeanor, and hence such features, seem less likely to be attractive in men.

4. Grooming features: Facial portraits usually include such grooming features as apparel and hairstyle, which may convey both social rank and self-esteem (Kaiser, 1985). Men wearing higher status clothing, such as a dark suit with a tie, tend to be rated more positively than those wearing lower status apparel, such as a loud polyester sportcoat or a T-shirt (cf. Hill, Nocks, & Gardner, 1987). Studies done in the 1970s reported that long male scalp hair was associated with negative evaluations (Pancer & Meindl, 1978), but hair length currently may not have the same negative implications that it once did, making the effect of male hair length difficult to predict.

Because maturity and dominance are more important variables in women's evaluation of men than males' evaluation of women (Buss, 1989; Costrich, Feinstein, Kidder, Maracek, & Pascale, 1975), it is reasonable to expect that the ideal male face will possess more maturity features than the ideal female face, such as a larger rather than a smaller chin (Keating, 1985; McArthur & Apatow, 1983/1984). Similarly, because physical attractiveness may be less important to women in their mating choices than it is to men, the correlations between feature measurements and attractiveness judgments may be weaker for women judging male faces than for men judging women's faces (Kerr & Kurtz, 1978; Morse, Gruzen, & Reis, 1976; Schulman & Hoskins, 1986).

Three quasi-experiments were designed to investigate the multiple motive hypothesis by measuring the specific features in adult human male faces that stimulate positive attractiveness ratings by adult women. It was expected that the neonate features of large eye size and small nose area, the mature features of prominent cheekbones and a large chin, the expressive features of a big smile, and the grooming features of high-status clothing and trimmed hair would all correlate with perceived attractiveness. Additional facial measurements, termed *facialmetrics,* also were taken to maintain continuity with Cunningham (1986). Finally, both linear and curvilinear tests were planned to contrast the multiple motive hypothesis with Symons's (1987) central tendency hypothesis.

Experiment 1

Method

Subjects. One hundred undergraduate women, mean age 19.83, who all happened to be White, volunteered to participate in this study in 1982–1983 as part of a requirement of an introductory psychology course at Elmhurst College, Elmhurst, Illinois.

Stimulus materials. Sixty black-and-white photographs of White senior college men from a current university yearbook from another state served as stimuli. Photographs were presented in a standard 4.5 × 6.5 cm size, mounted on 10 × 15 cm cards in a loose-leaf binder. The photos were randomly selected from the yearbook, except for the stipulation that the men not be wearing glasses. All photographs were frontal views portraying the head and shoulders. Forty-seven of the men were smiling, 13 were not smiling; 26 of the men were clean shaven, 21 wore mustaches, 13 wore beards; 32 wore coats and ties, 28 wore other clothing. Expressive features such as a smile might be conveyed more effectively in a videotape than in a still photograph (Friedman, Riggio,

[1] Smaller chins were classified as a neonate feature in Cunningham (1986) because female chins do not show the same effect of sexual maturation as do male chins. Note additional cues, such as thin skin and wrinkles, may be used to distinguish older, postmenopause women from younger but sexually mature women.

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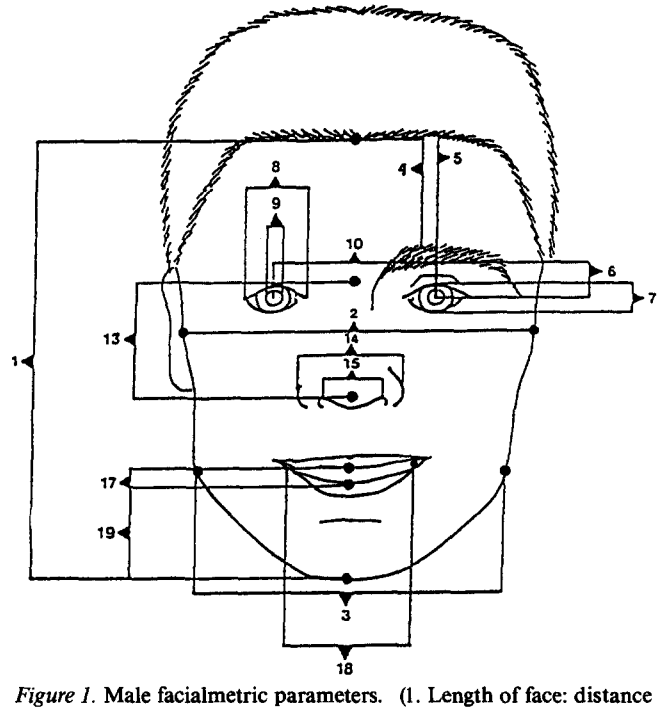

Figure 1. Male facialmetric parameters. (1. Length of face: distance from hairline to base of chin. 2. Width of face at cheekbones, distance between outer edges of cheekbones at most prominent point. 3. Width of face at mouth: distance between outer edges of cheeks at the level of the middle of the smile. 4. Forehead height: distance from eyebrow to hairline divided by length of face. 5. Vertical eye placement: vertical location of the eye measured from pupil center to hairline divided by length of face. 6. Eyebrow height: measured from pupil center to lower edge of eyebrow divided by length of face. 7. Eye height: distance from upper to lower edge of visible eye within eyelids at pupil center divided by length of face. 8. Eye width: inner corner to outer corner of eye divided by width of face at cheekbones. 9. Pupil width: measured diameter divided by width of face at cheekbones. 10. Horizontal eye separation: distance between pupil centers divided by width of face at cheekbones. 11. Cheekbone prominence: assessment of relative cheekbone prominence calculated as difference between the width of the face at the cheekbones and the width of the face at the mouth, divided by length of the face. 12. Cheek width: measured width of face at mouth divided by length of face. 13. Nose length: measured from bridge at level of inner edge of upper eyelid to nose tip, at level of upper edge of nostril opening divided by length of face. 14. Nostril width: width of nose at outer edges of nostrils at widest point divided by width of face at mouth. 15. Nose tip width: width of protrusion at tip of nose, usually associated with crease from nostril divided by width of face at mouth. 16. Nose area: calculated as the product of nose length and nose width at the tip divided by length of the face. 17. Smile height: vertical distance between lips at center of smile divided by length of face. 18. Smile width: distance between mouth inner corners divided by width of face at mouth. 19. Length of chin: distance from lower edge of lower lip to base of chin divided by length of face. 20. Hair color: 4-point scale, *blond* = 1; *black* = 4. 21. Hair length: 4-point scale; *above ears* = 1, *middle of ears* = 2, *bottom of ears to midneck* = 3, *midneck to shoulder* = 4. 22. Facial hair: *no facial hair* = 1, *mustache* = 2, *beard* = 3. 23. Presence of coat and tie: *no* = 0, *yes* = 1. 24. Higher status clothing style: *T-shirt or wrinkled sport shirt* = 1; *polo shirt; polyester sportcoat with vivid plaid, contrasting piping or trim; dark-colored shirt with light sportcoat* = 2; *corduroy sportcoat and tie or sweater and tie* = 3; *dark suit, light shirt, and tie* = 4. 25. Eye area: eye height ratio multiplied by eye width ratio. 26. Smile area: smile height ratio multiplied by smile width ratio.)

& Casella, 1988), but highly similar attractiveness ratings have been found when such dynamic and static media were compared (Brown, Cash, & Noles, 1986).

Procedure. A female experimenter asked individual subjects to give their ratings of the physical attractiveness of each man, using an 8-point scale ranging from *extremely unattractive* to *extremely attractive.* The experimenter allowed the subjects to spend as much time as they liked examining each picture and to return to reexamine any picture in the set.

Concurrent with the collection of attractiveness ratings, precise facialmetric assessments of the size of various facial features were made using a micrometer that is accurate to .05 mm. Extremely careful measurement is needed in this type of research, because a mere 1.5 mm separates the largest from the smallest example of some features in these photographs. Each photograph was independently measured by two female experimenters who were blind to the hypotheses and whose measurements correlated .93. A small number of differences greater than 5% were resolved by measurement by the third female experimenter; the two closest measurements were averaged and the erroneous measure was discarded. To control for minor variations in facial image size, the measurements were standardized as ratios to the indicated horizontal or vertical axis. Thus, what is later referred to as height of eyes, for example, represents the ratio of the eye height to the overall length of the face. The locations for the facialmetrics are indicated in Figure 1.

Results

The female judges provided highly reliable ratings of physical attractiveness, alpha = .93. Correlations between the facialmetric predictors and the mean physical attractiveness rating for each male target are presented in Table 1. The neonate facialmetrics of larger eye area, including higher and wider eyes, and a smaller overall nose size were correlated with more positive ratings. Forehead height, eye placement, and the width of the nose at the nostril and at the tip were not significantly related to attractiveness.

Curvilinear relations between the neonate facialmetric predictors and attractiveness were based on quadratic terms, constructed as the square of the deviation of the individual target's facialmetric assessment on a variable from the group mean of the variable. Table 1 contains the partial correlations of these facialmetric quadratic terms with attractiveness, with the effects of the linear term partialed out. The curvilinear analysis suggested that eye height that deviated from the mean was less attractive than eye height that was closer to the mean. Inspection of the scatter plot indicated that the data was negatively skewed and that unusually small eyes were associated with especially low attractiveness ratings, whereas extremely large eyes were associated with moderate to high attractiveness ratings. The curvilinear analysis of nose area indicated that men with features that were near the means of the distributions received higher ratings than men whose noses were either larger or smaller than average.

The maturity features of prominent cheekbones and a large chin were positively linked to attractiveness. The curvilinear relations with these variables were insignificant but did not exclude the possibility that there were limits to the linear rela-

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Table 1
Study 1: Correlation of Male Facialmetrics With Attractiveness Ratings by Women

Judgment	Zero-order correlations	Curvilinear partial *r*
Neonate feature		
Eye area	.43***	−.32*
Eye height	.33**	−.31*
Eye width	.41***	.01
Nose area	−.33**	−.36**
Nose length	−.02	−.24
Nose tip width	−.08	−.09
Nostril width	−.09	.03
Forehead height	−.10	.16
Vertical eye placement	−.10	.17
Horizontal eye separation	−.17	−.17
Mature feature		
Cheekbone prominence	.34**	.14
Cheek width	−.09	−.05
Chin length	.41***	.11
Mustache or beard presence	−.19	.07
Expressive feature		
Smile presence	.19	—
Smile area	.25*	−.06
Smile height	.19	.01
Smile width	.31*	.16
Eyebrow height	−.05	−.08
Pupil width	−.15	.07
Grooming feature		
Coat and tie presence	.00	—
Higher status clothing style	.35*	.11
Dark hair color	.08	.17
Scalp hair length	.01	−.20

Note. $N = 60$.
* $p < .05$. ** $p < .01$. *** $p < .001$.

tion between feature sizes and attractiveness, so that huge cheekbones or chins, which were not evident in this sample, could be unattractive. Cheek width and the presence of facial hair were not significantly associated with attractiveness. The expressive features of larger smile area and a wider smile also were positively linked to attractiveness ratings; but smile presence, smile height, eyebrow height, and pupil width were not significant predictors.

The grooming feature of a higher status clothing style was associated with higher attractiveness ratings. The presence of a coat and tie, independent of style, was not associated with perceived attractiveness. Hair color was not correlated with attractiveness, but the curvilinear analysis indicated that medium-length scalp hair was associated with higher attractiveness ratings.[2]

Discussion

Supporting the multiple motive hypothesis was the fact that women rated as more attractive those men who possessed the neonate features of large eyes and a small nose area, the mature features of prominent cheekbones and a large chin, the expressive feature of a large smile, and the grooming feature of high-status clothing. Consistent with Symons's central tendency hypothesis were the findings for nose area and hair length that moderate size seemed more desirable than the ends of the distribution. Yet, on most variables, the ideal male face was not an average face with each feature balanced between the extremes of neoteny and maturity. Instead, the most attractive male faces possessed some features, such as large eye height and width, that were extremely neotenous and possessed other features, including large cheekbones and a large chin, that were extremely mature. Thus, the ideal man conveyed both cuteness and ruggedness and may have elicited female responses of both nurturant affection and respect.

Many of the facialmetrics that predicted female attractiveness, including large eyes, small nose area, prominent cheekbones, and a large smile (Cunningham, 1986), also predicted male attractiveness, but some features associated with female attractiveness were not significantly correlated with male ratings. Smaller cheek width was associated with attractiveness ratings of women but not of men, which could be because American norms for ideal weight are more lenient for men than for women. Alternatively, some attractive men may have possessed large cheek width measurements because of their attractive large cheekbones and chins, whereas other, less attractive men simply appeared to be plump. The expressive features of highly set eyebrows and dilated pupils also were associated with female but not male attractiveness. It is possible that those features convey interest and responsivity, which are not clearly desirable or undesirable attributes in a man. Finally, a predicted difference between the genders was found, so that larger chins were desirable for men, whereas smaller chins were found to be desirable for women. Thus, physiognomic preferences were consistent with sex role stereotypes in conveying more maturity and dominance in the attractive male face than in the attractive female face.

Experiment 2 was designed to replicate the relationships between male facialmetrics and female ratings of male attractiveness, using an additional set of stimuli and the additional rating dimension of facial babyishness. In light of the multiple motive hypothesis that the ideal male face possesses both neonate and mature features, it was expected that a man's attractiveness would bear a curvilinear relationship to perceived maturity/babyishness. Such a curvilinear relation was evident in McArthur and Apatow (1983/1984) but not in Berry and McArthur

[2] We conducted a series of multiple regression analyses, using the facialmetrics in Table 1 to predict attractiveness ratings. Each facial category was found to contribute to attraction; neonate eye area (.47), mature chin length (.41), and expressive smile area (.20) all were significantly related to attractiveness, $R = .65$, $F(3, 56) = 13.86$, $p < .0001$. Because of multicollinearity, all of the facialmetric variables could not be examined simultaneously. The strongest prediction was achieved by an eight-variable model, $R = .83$, $F(8, 51) = 14.06$, $p < .0001$, which accounted for 68.8% of the variance in mean attractiveness ratings. The neonate features of eye height (beta = .24), eye width (.20), nose area (−.32), and quadratic nose length (−.27); the mature features of prominent cheekbones (.37) and large chin (.26), the expressive feature of smile height (.25), and the grooming feature of clothing style (.23) all were significant independent predictors of attractiveness.

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(1985).[3] The relation of facialmetrics to the men's reproductive fitness also was explored in terms of the number of times that a man was selected as the female subjects' first choice for dating and for marriage.

Experiment 2

Method

Subjects. Sixty undergraduate women, mean age 18.90, including 54 Whites and 6 Blacks, volunteered to participate in this study in 1985 as part of a requirement of a general psychology course at the University of Georgia.

Stimulus materials. Twenty White college students from a university dormitory served as models for the photographs. During debriefing, experimenters determined that the female subjects were not personally acquainted with the male targets. Black-and-white frontal head-and-shoulder photographs of the men were produced in a standard 7.5 × 11.5 cm size. Because the previous study found that most men smiled while posing, all of the men were instructed to smile. Each of the men wore a dark sportcoat, a light-colored shirt, and a tie. All of the men had medium-length hair; 16 of the men were shaven, and 4 wore mustaches.

Procedure. Individual subjects were asked by a female experimenter to evaluate each of the photographs, one at a time, on 14 dimensions using 6-point scales, including the dimensions of *baby face–mature face* and *unattractive–attractive,* which were the principal dependent measures. After they made all of the ratings, the subjects were asked to estimate the age of each man, to designate the man that they would most like to date, and to designate the man that they would most like to marry, who could be the same or a different individual.

A female experimenter who was blind to the hypotheses made facialmetric assessments with a micrometer for the parameters noted in Experiment 1. Distance between the eyes and pupil size were not measured in this study; instead, two additional assessments of maturity features were taken: thickness of eyebrows—top edge to bottom edge of eyebrow, measured above pupil center divided by length of face; and chin width: distance between edges of jaw measured at midpoint of chin length divided by length of face. Chin width also allowed calculation of chin area. Independent facialmetric assessments were made by Michael R. Cunningham, using a Chorus Data Systems (Merrimack, New Hampshire) Model 1540 image-digitizing board operating in an IBM personal computer A.T. with Media Cybernetics (Silver Spring, Maryland) Image-Pro software. This equipment magnified the photograph and allowed computerized feature measurements to .0001. Although this procedure increased the precision of the measurements, facialmetrics obtained with the micrometer were quite reliable; the average interrater correlation between the two measurement procedures was .96.

Results

Facialmetric predictors of attractiveness. The ratings made by the White women and the Black women did not differ significantly and were combined. The judges' ratings of attractiveness and baby-facedness displayed adequate reliability, alpha = .71 and .57, respectively. The correlations between facialmetric assessments and ratings of attractiveness and baby-facedness are presented in Table 2.

The neonate features of larger eye area, including higher and wider eyes, and the maturity features of thicker eyebrows, more prominent cheekbones, and larger chin area (including a longer and a wider chin) also displayed significant or marginally significant relations with attractiveness. The expressive features of greater smile area and a higher and wider smile also tended to be associated with attractiveness, as was the grooming features of being clean shaven. Because fewer photographs were used to produce the second than the first data set, there was less likelihood that any curvilinear trend could be detected. The curvilinear relations were negligible between attractiveness and nose area (*partial* $r = -.14$, *ns*) and hair length (*partial* $r = -.13$, *ns*).[4]

Table 2
Study 2: Correlation of Male Facialmetrics With Attractiveness and Baby Face Ratings

Judgment	Attractive	Baby face
Neonate feature		
Eye area	.55**	−.23
Eye height	.41*	−.15
Eye width	.52**	−.27
Nose area	−.10	−.04
Nose length	−.07	.15
Nose tip width	−.01	−.07
Nostril width	−.01	−.13
Forehead height	.17	−.09
Eye placement	.19	.03
Mature feature		
Cheekbone prominence	.40*	.05
Cheek width	−.11	.08
Chin area	.47**	−.24
Chin length	.43*	−.28
Chin width	.39*	−.16
Eyebrow thickness	.35	−.39*
Mustache presence	−.38*	−.43*
Expressive feature		
Smile area	.43*	−.01
Smile height	.41*	−.03
Smile width	.42*	−.01
Eyebrow height	.09	.38*
Grooming feature		
Dark hair color	−.33	−.30
Scalp hair length	.23	−.07

Note. $N = 20$.
* $p < .10$, two-tailed. ** $p < .05$, two-tailed.

Babyfacedness. The impression that a man possessed a baby

[3] Note that a curvilinear relation between attractiveness and possessing a baby face requires that there be more men with the *alpha pattern of intermediate maturity appearance,* with the neonate features of large eyes and small noses and the mature features of prominent cheekbones and large chins, than with the *beta intermediate maturity pattern,* with low-neonate small eyes and large noses combined with immature round cheeks and small chins. Regarding facial samples, note also that obtaining a linear relation between feature size and attractiveness requires that the desirable features not be negatively correlated with each other nor positively correlated with undesirable features. If all of the men with large chins gave small smiles, for example, the relation between large chin size and attractiveness could be artifactually attenuated. This potential problem can be prevented if more than 15% of the target faces are determined to be highly attractive in pretesting.

[4] A multiple regression analysis determined that eye area (beta = .47), chin area (beta = .39), and smile area (beta = .31) all made independent contributions to the prediction of attractiveness, $R = .76$, $F(3, 16) = 7.21$, $p < .003$.

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face seemed to be most influenced by his hair, as suggested by marginal trends involving the absence of a mustache or beard, thin eyebrows, and highly set eyebrows. The presence of facial hair in some men may have distracted the women from attending to other cues to babyishness, such as large eyes and a small chin.

The dimension of perceived baby-facedness was inversely correlated with perceived age, $r(18) = -.79$, $p < .001$, but was not linearly correlated with perceived attractiveness, $r(18) = -.19$, dating choices, $r(18) = -.01$, or marriage choices $r(18) = .05$, all *ns*. The perceived ages of the targets ranged from 18.68 to 21.85 years. Within that narrow range, perceived age was not correlated with perceived attractiveness, $r(18) = -.04$, choice for dates $r(18) = -.12$, or marriage $r(18) = -.18$, all *ns*.

A curvilinear term, which was based on the absolute value of the deviation of each man's perceived maturity/baby-facedness from the group mean was calculated and was marginally correlated with dating choices, $r(18) = -.40$, $p < .07$; marriage choices, $r(18) = -.37$, $p < .10$, and rated attractiveness, $r(18) = -.29$, $p < .16$. Thus, male faces that were intermediate between mature and baby faced were marginally more desirable to women than faces that were either extremely mature or extremely baby faced.

Discussion

Experiment 2 replicated the direction and magnitude of most of the correlations of the first study, although because of the smaller number of stimuli and lower resulting statistical power, fewer effects were significant at the .05 level. Congruent with the multiple motive hypothesis, the neonate features of higher and wider eyes, the mature features of prominent cheekbones and a large chin, and the expressive feature of a big smile tended to be associated with rated male physical attractiveness.

There were some minor discrepancies in the results of the two studies; nose measurements were not significantly related to attractiveness in the second study, perhaps because of a narrower range of noses in the second set of targets. A clean-shaven face tended to be associated with attractiveness in the second study but not in the first study. Such differences could have been due to regional differences in female aesthetic preferences or to the correlation of facial hair with more direct predictors of attractiveness in the second investigation.

The present study was consistent with Berry and McArthur (1985) in finding high eyebrows to be marginally related to baby-faced appearance and finding forehead height and nose size to be uncorrelated with a baby-faced appearance. The present study failed to confirm Berry and McArthur's (1985) observation that large eye size and narrow chin width were associated with a baby-faced appearance, perhaps because a number of men in this study possessed both large eyes and large chins. Because impressions of baby-facedness in Experiment 2 were marginally influenced by the man's facial hair, Experiment 3 explores the attractive–baby-faced relation using men without mustaches or beards.

Previous research has been contradictory concerning the relation of a baby-faced appearance versus a mature appearance with attractiveness. This study found that female preferences displayed a marginal curvilinear relation to the baby face–maturity dimension, consistent with the multiple motive hypothesis that the ideal male face possessed ideal neonate and ideal mature features.

Experiment 3

Method

The third investigation to replicate the relation of physical features to impressions of attractiveness found in the previous studies, using an additional sample of target stimuli. The curvilinear relation between baby-facedness and attractiveness was explored, using men without facial hair. We used an additional facial dimension related to sex-typing, masculinity–femininity, to clarify the relations of facial impressions to mating choices.

Subjects. Ninety undergraduate women, mean age 20.90, including 83 Whites, 6 Blacks, and 1 Asian, volunteered to participate in this study in 1988 as part of a requirement of a general psychology course at the University of Louisville, Kentucky.

Stimulus materials. Black-and-white photographs of the men were produced in a standard 8.25 × 11.75 cm size. Thirty White male college students with medium-length hair, none of whom were wearing mustaches or beards, served as models for the photographs. All of the men were instructed to smile while posing and to wear a light-colored shirt and dark tie.

Procedure. A female experimenter asked individual subjects to evaluate each of the photographs, one at a time, using twenty-four 7-point scales. Some of the dimensions were *not attractive appearance–attractive appearance, not at all baby faced–very baby faced, feminine face–masculine face, angular face–round face, not desirable to date–desirable to date, not desirable to marry–desirable to marry.* All subjects used the same rating form, which reversed the order of items for attractiveness and baby face judgments from that used in the preceding study. A male experimenter who was blind to the hypotheses made facialmetric assessments with a micrometer for the parameters noted in Quasi-Experiment 2. Independent assessments were made by Michael R. Cunningham, using the digitizing measurement procedure noted in the previous experiment. The average interrater correlation was .94. Although all of the men were clean shaven, they differed in the amount of facial hair that had grown back by the midafternoon portrait session. Five independent judges evaluated whether some beard growth was visible on the targets' faces, with 84% agreement. Eleven men were seen by the majority of judges to display visible beard growth.

Results

The subjects provided reliable ratings for the three primary dependent variables of attractiveness, baby face and masculinity; alpha = .86, .83, and .90, respectively. As Table 3 indicates, higher attractiveness ratings tended to be given to men with the neonate features of greater eye area, higher and wider eyes, and lower placed eyes; the mature features of thicker eyebrows, marginally more prominent cheekbones, larger chin area, and longer and marginally wider chins; and the expressive features of marginally greater smile area, including a wider and marginally higher smile, and higher placed eyebrows.[5] As in the second study, the curvilinear relation of nose area with attractiveness

[5] A multiple regression analysis confirmed that eye area (beta = .37), chin area (beta = .33), and smile area (beta = .33) all made significant contributions to the prediction of attractiveness, $R = .65$, $F(3, 26) = 6.35$, $p < .002$.

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Table 3
Study 3: Correlation of Male Facialmetrics With Attractiveness, Baby Face, and Masculinity Ratings

Judgment	Attractive	Baby face	Masculine
Neonate feature			
Eye area	.50**	−.18	.11
Eye height	.38**	−.13	.07
Eye width	.49**	−.19	.12
Nose area	−.03	−.01	−.01
Nose length	.12	−.18	.10
Nose tip width	−.20	.17	−.35*
Nostril width	.12	.02	−.06
Forehead height	.18	.05	−.08
Eye placement	.32*	.03	−.03
Mature feature			
Cheekbone prominence	.31*	.02	−.15
Cheek width	−.19	.05	.02
Chin area	.39**	−.05	.11
Chin length	.37**	−.05	.12
Chin width	.31*	−.01	.08
Eyebrow thickness	.40**	−.31*	.40**
Beard growth visible	.26	−.55**	.56**
Expressive feature			
Smile area	.34*	−.29	.34*
Smile height	.34*	−.25	.33*
Smile width	.44**	−.43**	.42**
Eyebrow height	.35**	−.06	.17
Grooming feature			
Dark hair color	.07	−.29*	.25
Scalp hair length	.07	−.07	.14

Note. $N = 30$.
* $p < .10$, two-tailed. ** $p < .05$, two-tailed.

was not significant, partial $r = -.09$. Ratings of attractiveness were highly correlated with judgments of desirability to date, $r(28) = .97$, and desirability to marry, $r(28) = .93$, both $ps < .0001$.

Baby face ratings. Baby face ratings were negatively correlated with judgments of desirability to marry, $r(28) = -.37$, $p < .05$, and marginally correlated with desirability to date, $r(28) = -.33$, $p < .07$, and attractiveness, $r(28) = -.29$, $p < .10$. Baby face impressions were correlated with perceptions of a round face rather than an angular face, $r(28) = .56$, $p < .001$. Facialmetric predictors included the absence of beard stubble and the trends for thinner eyebrows and lighter hair color. Babyishness also was associated with narrower smile width, which may be due to the inverse relation between babyishness and attractiveness. The eyebrow height trend obtained in Experiment 2 was not replicated, although babyishness was again associated with the absence of facial hair. A more complex pattern also was apparent.

Inspection of the men perceived by the subjects to possess baby faces suggested that two different types of faces elicited such ratings. Some of the baby faces were plump and endomorphic, with smiles that were dwarfed by their rotund cheeks, and other baby faces appeared to portray late-maturing ectomorphs, with narrow faces. To pursue the impression of two types of baby face configurations, photos were divided into Sheldon's (1954) categories of endomorph, ectomorph, and mesomorph, using facialmetric criteria.[6] A man was classed as an endomorph if he possessed relatively round cheeks and a small chin, as indicated by being in the largest third of the distribution in cheek width and the lower two thirds of the distribution in chin area. A man was classed as an ectomorph if he had a narrow face and a relatively small chin, by being in the smallest third of the distribution in cheek width and the smaller two thirds of the distribution of chin area. Finally, a man was classed as a mesomorph if he was in the middle third of the distribution of cheek width or the largest third of the distribution in chin area.

Using this typology, we found 6 endomorphs, 9 ectomorphs, and 15 mesomorphs. An analysis of variance indicated that ratings of baby-facedness were significantly related to facial type, $F(2, 27) = 5.50$, $p < .01$, so that both the rotund endomorphs ($M = 4.68$) and thin ectomorphs ($M = 4.16$) were seen as more baby-faced than the mesomorphs ($M = 3.41$). The fact that baby faces were at both ends of the distribution of shape, combined with the strong association of babyishness with the absence of facial hair, may have precluded more significant linear facialmetric relations with baby-facedness. Indeed, 46% of the variance in ratings of babyishness were accounted for by beard growth (beta = −.47) and nonmesomorphic facial type (beta = −.41), $R = .68$, $F(2, 27) = 11.65$, $p < .0001$. Facial type ratings also displayed a modest association with attractiveness, so that mesomorphs ($M = 4.22$) tended to be rated as marginally more attractive than ectomorphs ($M = 3.86$) or endomorphs ($M = 3.28$), $F(2, 27) = 2.99$, $p < .07$.

Study of Experiment 3 found support for the curvilinear association between baby-facedness and attractiveness that was marginally evident in the previous study. With the linear relation controlled, the relation of attractiveness to the absolute values of the deviation of the baby face scores from their mean was partial $r = -.42$, $p < .05$, indicating that women preferred men who were intermediate on babyishness. The curvilinear baby face term also was negatively correlated with ratings of the men's desirability to marry partial $r = -.41$ and to date partial $r = -.41$, both $ps < .05$, indicating that men with faces suggesting intermediate babyishness were preferred.

Masculinity. Perceived masculinity was strongly negatively correlated with the perception of a baby face, $r(28) = -.86$, $p < .001$, suggesting that subjects used similar criteria to judge facial masculinity versus femininity and facial babyishness versus maturity. Ratings of facial masculinity were correlated with the possession of an angular face rather than a round face, $r(28) = .40$, $p < .05$, plus thicker eyebrows, visible beard stubble, marginally smaller nose width, and larger smiles. The last two relations may have been due to the relation of perceived masculinity with attractiveness, noted later. Masculinity was also associated with facial type, so that mesomorphs ($M = 5.02$) were seen as more masculine than either ectomorphs ($M = 4.31$) or endomorphs ($M = 4.14$), $F(2, 27) = 8.31$, $p < .002$. Thus, similar to babyishness, the fact that masculinity was strongly linked with facial type and facial hair may have obscured other facialmetric correlations. In fact, 63% of the vari-

[6] The presence of mustaches on 20% of the men, and the smaller number of stimuli, made it inadvisable to perform this analysis in Experiment 2.

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ance in perceived facial masculinity was accounted for by the independently significant variables of beard growth (beta = .48), mesomorphic facial type (beta = .42), and eyebrow thickness (beta = .27), $R = .80$, $F(3, 26) = 14.99$, $p < .0001$.

Perceived masculinity was positively correlated with desirability to marry, $r(28) = .38$, $p < .05$; desirability to date, $r(28) = .36$, $p < .05$; and attractiveness, $r(28) = .33$, $p < .06$. In a multiple regression analysis, attractiveness ratings were significantly predicted both by the linear masculinity variable, beta = .38, and a curvilinear masculine face variable that was based on the absolute value of the deviations of the masculine face scores from their mean, beta = −.36, both $ps < .05$. Thus, women preferred men who were clearly but not extremely masculine in their appearance.

Discussion

The results of Experiment 3 generally confirmed those of the preceding two studies concerning the relation of facialmetrics to male attractiveness. Nose size was a poor predictor of attractiveness in the third study, as it was in the second study. Hair color was unrelated to attractiveness in the third study, paralleling the inconsistency in the hair color literature (Feinman & Gill, 1978). Because neither the first nor the second study found eyebrow height or eye placement to be related to attractiveness, those correlations in the third study must be viewed with caution.

To facilitate comparisons across the experiments (Rosnow & Rosenthal, 1989), a series of meta-analyses were conducted using weighted linear combinations of the correlations from Experiments 1 through 3 (Hedges & Olkin, 1985, pp. 230–232). Table 4 presents the z_+ statistics (the average of the z-transformed values of the rs in the three studies, weighted by their respective degrees of freedom); the mean rs, transformed from the z_+ statistics; and the z test statistics for each variable. These analyses confirm that male facial attractiveness was associated with the neotenous features of a large eye area (including high and wide eyes) and small nose area; the mature features of a large chin area (including a long and wide chin), prominent cheekbones, and thick eyebrows; and the expressive feature of a large smile area (including a high and wide smile).

The finding that male physical attractiveness is correlated with features from several categories serves to resolve the apparent conflict between the findings of Keating (1985) and those of Berry and McArthur (1985), because both babyish and dominant-appearing facial attributes were associated with greater desirability. There also were indications, marginal in the second study and stronger in the third study, that the most attractive male face was intermediate rather than extremely mature or baby-faced. The curvilinear relation between attractiveness and perceived baby-facedness lends further support to the multiple motive hypothesis of female attraction, which suggested that women prefer men who appear to possess childlike, mature, and expressive qualities.

The multidimensional nature of physical attractiveness suggests the value of stringent facialmetric assessment of target stimuli for future research on the effects of physical attractiveness on behavior. An extremely high physical attractiveness rating probably requires high scores on all of the major desirable facialmetric categories, but a moderately high rating might be obtained through a number of different combinations of desirable features. For example, the facialmetric attributes of neoteny, maturity, and expressivity can be combined to create eight different types of faces, ranging from the unattractive face, which is low on all three desirable dimensions, through six types of faces containing one or two desirable attributes to the ideal face, which is high on all three dimensions.

The person perception targets used in most investigations were classed as high in physical attractiveness if they simply obtained higher-than-average global ratings from a panel of judges. Yet a fairly high physical attractiveness rating may be obtained simply through contrast with highly unattractive targets (Kenrick & Gutierres, 1980; Wedell, Parducci, & Geiselman, 1987). If target men are only moderately high in facialmetric physical attractiveness, they may differ in the positive attributes that they possess. Inconsistent findings in the association of globally perceived male and female appearance with occupational success and status, for example, may be due to the higher attractiveness targets in different studies possessing different combinations of facialmetric attributes (Cash, 1981; Cash & Kilcullen, 1985; Dickey-Bryant, Lautenschlager, Mendoza & Abrahams, 1986; Hatfield & Sprecher, 1985; Heilman & Saruwatari, 1979; Kalick, 1988; Mazur, Mazur, & Keating, 1984; Udry & Eckland, 1984). It is possible that the more attractive targets in one study possessed high maturity and high grooming, whereas in another study the more attractive targets possessed high neoteny and high expressivity, with different associa-

Table 4
Meta-Analyses of Correlations of Facialmetrics With Attractiveness

Judgment	Z_+	Rho	Zeta	p
Neonate feature				
Eye area	.51	.47	5.13	.0001
Eye height	.37	.36	3.76	.0001
Eye width	.49	.46	4.89	.0001
Nose area	−.22	−.22	2.20	.03
Nose length	.01	.01	.09	.92
Nose tip width	−.10	−.10	1.02	.31
Nostril width	−.02	−.02	.21	.83
Forehead height	.02	.03	.21	.83
Eye placement	.07	.07	.65	.52
Mature feature				
Cheekbone prominance	.36	.35	3.59	.0001
Cheek width	.09	.09	.86	.39
Chin area	.45	.42	2.98	.003
Chin length	.43	.41	4.29	.0001
Chin width	.36	.35	2.36	.02
Eyebrow thickness	.40	.38	2.66	.01
Expressive feature				
Smile area	.41	.39	4.12	.0001
Smile height	.28	.28	2.78	.005
Smile width	.38	.37	3.85	.0001
Eyebrow height	.09	.09	.85	.40
Grooming feature				
Dark hair color	.01	.01	.06	.95
Scalp hair length	.06	.06	.64	.52

Note. $N = 110$—except chin area, chin width, and eyebrow thickness, $n = 50$.

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tions with occupational outcomes. Further research on the effects of appearance, therefore, can provide greater insight by determining the extent to which the targets possess each of the facialmetric constituents of physical attractiveness.

Perceptions of the dimensions of babyishness and masculinity may involve additional complexities. The only linear facialmetrics that tended to predict babyishness versus maturity in two studies were the mature features of eyebrow thickness and facial hair growth. In retrospect, it was probably inappropriate to use baby face versus mature face as a bipolar continuum, because the two poles were not mutually exclusive. A number of faces in the present samples possessed both highly neonate and highly mature features, which lead them to be seen as intermediate on the baby face–mature dimension and precluded correlations with either neonate or mature facialmetrics. Configural analyses were more successful, however, so that perceptions of facial babyishness and low masculinity were associated both with the rounded face of the endomorph and the narrow face of the ectomorph. Yet although both endomorphic and ectomorphic facial types may be seen as immature, they may entail different patterns of attributions, which should be examined in future research.

Age contributes to the development of maturity features, so the men who possessed such features, such as mesomorphs, may have been seen as somewhat older than the men who did not possess strong maturity features. Age was uncorrelated with attractiveness in the second experiment, however, suggesting that the perception of optimal age may be a necessary but not sufficient condition for attraction (cf. Korthase & Trenholme, 1982).

Perceptions of masculinity were correlated with attractiveness ratings, suggesting that the appearance of sex-role-appropriate dispositions contributes to mating desirability (Bar-Tal & Saxe, 1976; Gillen, 1981). Yet, most of the facialmetrics that predicted attractiveness did not predict masculinity. The strong effect of facial hair and mesomorphic facial type on masculinity ratings may have precluded other facialmetrics from exerting an influence, similar to the case with the prediction of babyishness. The effects of facial hair on masculinity and baby face judgments were evident in the third study despite efforts to control it by using only clean-shaven men, illustrating both the complexity and the potential for serendipitous findings inherent in quasi-experimental research. Furthermore, the strong negative relation between perceived masculinity and perceived babyishness suggests that attributions of feminine versus masculine sex-typed characteristics may play a role in the relation of babyishness/maturity to trait dimensions, such as perceived criminality (cf. Berry & McArthur, 1986, 1988; Bull & Green, 1980; Goldstein, Chance, & Gilbert, 1984).

A number of investigators found relations between physical appearance and behavioral dispositions (Berry & Brownlow, 1989; Goldman & Lewis, 1977; Reis et al., 1982). Yet, even if most physiognomic traits are unrelated to psychological traits, women's physical attractiveness preferences still may represent attempts to select ideal personalities in their dates and mates. A man who possesses an attractive combination of neotenous, mature, expressive, and good grooming features; who looks outgoing and well dressed, rugged but also cuddly, and masculine but not extremely sex typed may appear to offer the best chance for an affectionate, high-status, androgynous mate. Yet, because women differ in their own maturity and sex-role orientation, the relation of individual differences such as sex typing and self-monitoring to preferred facial features warrants exploration in future research (cf. Cash & Kilcullen, 1985; Moore, Graziano, & Millar, 1987; Morse, Gruzen, & Reis, 1976; Pike, 1989; Snyder, Berscheid, & Glick, 1985).

Although a face that is high in neoteny, maturity, expressivity, and grooming may be attractive in many races and cultures (Cunningham, Roberts, Richards, & Wu, 1989), some group differences in facial evaluations may exist, particularly in desired body weight and coloration. The developmental origins of the perceptions of facial features and their associations with attributions of attractiveness and personal qualities in different social groups requires further investigation (cf. Brooks & Lewis, 1976; Langlois et al., 1987; McArthur & Baron, 1983).

Attraction responses also may be influenced by individual differences in the perceiver's emotional state. When an individual is experiencing a negative mood, for example, warmth and acceptance may seem particularly desirable and masculine attitudes may seem repellant. Such a motivational state may cause greater attraction to faces high in neoteny and expressivity and less attraction to faces high in maturity (Cunningham & Wong, 1989). Thus, although the present research has endeavored to specify the complex constituents of the ideal face, the role of individual differences in social perception and attraction also must be recognized.

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